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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/331,829	06/23/1999	HIROSHI SUZUKI	1576.77	2131

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EXAMINER

SELLERS, ROBERT E

ART UNIT	PAPER NUMBER
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1712

31

DATE MAILED: 02/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/331,829

Applicant(s)

SUZUKI ET AL.

Examiner

Robert Sellers

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1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003 and 27 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 23-34 is/are pending in the application.
- 4a) Of the above claim(s) 25-28 and 30-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23, 24 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 23-34 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

The election with traverse of Group I in Paper No. 30 is acknowledged. The traversal is on the grounds that Section 121 requires the inventions to be independent and distinct. This is not found persuasive because according to MPEP § 802.01, "[t]he law has long been established that dependent inventions (frequently termed related inventions) . . . may be properly divided if they are, in fact, 'distinct' inventions, even though dependent." The inventions of Groups I-VI have been established as distinct based on the reasons espoused on pages 3-5 of the restriction requirement mailed December 5, 2002 (Paper No. 29).

The requirement is still deemed proper and is therefore made FINAL.

Claims 11-22 presented in the preliminary amendment faxed October 30, 2002 were the subject of the restriction requirement mailed December 5, 2002. The amendment filed December 27, 2002 (Paper No. 30) cancels claims 11-22 and presents new claims 23-34. According to page 8, the last paragraph of the amendment, the election of Group I is acknowledged wherein new claims 23, 24 and 29 correspond to the elected claims 11, 12 and 17.

Claims 25-28 and 30-34 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction requirement in Paper No. 30.

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The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23, 24 and 29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed.

The paragraph bridging pages 6 and 7 support a composition comprising an epoxy resin, a curing agent and the tetrakisphenol compound of formula (I). There is no support for the claimed epoxy resin being "non-curing" in claim 23, line 2 and claim 29, line 1 since such a term implies the lack of reaction of the epoxy resin with the curing agent at any point which contradicts the claimed "curing agent" or "compound" capable of "reacting with the epoxy group of the epoxy resin to cure the resin" in claim 23, lines 3-4 and claim 29, lines 2-3.

Page 14, lines 28-30 and page 15, lines 9-13 substantiate the designation of the tetrakisphenol compound of claim 23 as a "curing catalyst" as opposed to the denoted "curing accelerator catalyst."

The 35 U.S.C. 103(a) rejection over Japanese Patent Nos. 5-194711 and 6-329570 and Asai et al. does not pertain to claims 23 and 24 due to the claimed non-clathrated curing agent blended with a tetrakisphenol which precludes the clathrate of an epoxy resin curative and a tetrakisphenol taught by the combined prior art. The rejection with respect to claim 29 has been overcome by the unexpected prolonged pot life exhibited in the comparative testing detailed hereinbelow.

The closest prior art comparisons involve those comparative examples employing the bisphenol A host of Japanese '711 (page 15, Host compound 14). Comparison Example 2 on page 29 of the specification describes the preparation of Sample No. 54 which according to Table 3 on page 28 contains a clathrate of 2-methylimidazole and bisphenol A. Example 2 discloses the production of Sample No. 32 which according to Table 2 on page 25 contains a clathrate of 2-methylimidazole and a claimed species of 1,1,2,2-tetrakis(4-hydroxyphenyl)ethane. Table 4 on page 32 reveals that the pot life for Sample No. 32 is about 18 hours, whereas the pot life for Sample No. 54 is only about 5 hours.

Comparison Example 4 on page 33 sets forth the preparation of Sample No. 49 which according to Table 3 contains a clathrate of ethylenediamine and bisphenol A. Example 4 shows the production of Sample Nos. 10 and 11 which according to Table 1 on page 24 contains a clathrate of ethylenediamine and claimed species of 1,1,2,2-tetrakis(4-hydroxyphenyl)ethane and 1,1,2,2-tetrakis(3-methyl-4-hydroxyphenyl)ethane, respectively.

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Table 6 on page 35 indicates that the pot life of Sample No. 10 is about 180 hours, Sample No. 11 in excess of 180 hours, and Sample No. 49 is about 2 hours.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Zupancic et al.

Zupancic et al. in Example 38 (col. 22) shows a composition comprising 1073.7 grams of DER 331 epoxy resin having an epoxy equivalent weight of 182 which contains 5.90 epoxy groups ( $1073.7 \text{ g} \div 182 \text{ g/epoxy eq.} = 5.90 \text{ epoxy group}$ ) and 81.2 grams of tetraphenolethane which is 0.175 mole ( $81.2 \text{ g} \div 462 \text{ g/mole} = 0.175 \text{ mole}$ , the molecular weight of tetraphenolethane calculated from the formula  $\text{C}_{26}\text{H}_{22}\text{O}_4$ ) along with N-benzyl-dicyandiamide curing agent. The content of tetrakisphenol is  $0.175 \text{ mole} / 5.90 \text{ epoxy groups} = 0.03 \text{ mole}$  of tetraphenolethane per mole of epoxy group, thereby falling within the range of from 0.001 to 0.1 mole of tetrakisphenol per mole of epoxy group defined in claim 24.

Examples 39 and 40 (cols. 23-24, 0.01 mole of tetraphenolethane per mole of epoxy group), Examples 41-43 and 47 (cols. 24-25 and 27, 0.03 mole of tetraphenolethane per mole of epoxy group) and Example 44 (col. 26, 0.05 mole of tetraphenolethane per mole of epoxy group) also exhibit tetrakisphenol contents within the confines of claim 24.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 23 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schreiber Patent Nos. 4,246,162 or 4,668,718 or Koike et al. or Dewhirst.

Schreiber '162 (col. 6, Table 2, Example 7 wherein hardener F is 1,1,2,2-*p*-tetraphenylethane according to col. 4, line 58), Schreiber '718 (col. 7 table, Molding composition 4 wherein curing agent B is 1,1,2,2-tetrakis(hydroxyphenyl)ethane according to col. 5, lines 30-32), Koike et al. (col. 9, Example 14) or Dewhirst (col. 1, lines 41-56 and col. 2, line 51) shows or discloses a formulation comprising an epoxy resin, an imidazole or secondary aromatic diamine (Dewhirst) curative, and a 1,1,2,2-tetrakis(hydroxyphenyl)ethane curing agent.

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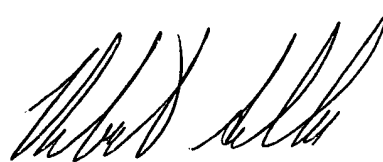
The claimed tetrakisphenol compound designated as a curing accelerator catalyst embraces the 1,1,2,2-tetrakis(hydroxyphenyl)ethane of the patents regardless of their designation as a curing accelerator catalyst since in the absence of the catalytic tetrakisphenol content of claim 23, the phenolic hydroxyl groups of the claimed tetrakisphenol are highly reactive with the epoxy resin and are indistinguishable from the prior art 1,1,2,2-tetrakis(hydroxyphenyl)ethane functioning as a curing agent. More favorable consideration would be given with respect to this rejection if the limitations of claim 24 were inserted into independent claim 23 with the cancellation of claim 24.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

European Patent No. 304,125 espouses a mixture of an epoxy resin and a tetraphenolic curing agent in an phenolic hydroxyl group:epoxy group equivalent ratio of from 0.67:1 to 2:1, optionally including a catalyst such as an imidazole.

Japanese Patent No. 7-76538 is directed to a tetrakis(hydroxyphenyl)alkane useful as a clathrate host compound for a monomer. The claimed clathrate of claim 29 hosting an epoxy-reactive curing agent is not recited.

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